GNATHODUS PANDER, 1856 (CONODONTA): PROPOSED DESIGNATION OF A TYPE SPECIES UNDER THE PLENARY POWERS. Z.N.(S.) 2279.

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Pander (1856: 33, 34) described the conodont genus *Gnathodus* for forms:

"In den Mergeln der untersten Schichten des Bergalks im Tulaschen und der höheren des Moskauschen Gouvernements kommen wohlerhaltene kieferartige Ueberreste vor, die sich durch ihre Gestalt und die Beschaffenheit ihrer Basis von den bis jetzt beschriebenen unterscheiden, durch die microscopische Structur aber sich eng an sie anschliessen. Auf einer hohen, aus doppelten Wänden bestehenden, schmalen Platte, erheben sich, in einer Reihe, kleine Zähnchen und geben dieser das Ansehen, als wenn sie von einem gezähnten Rande begrenzt werde. Nach unten gehen diese Platten auf der einen Seite stark auseinander und bilden eine Höhle, während sie auf der entgegengesetzten noch aneinander bleiben. Diese Höhle, welche die Pulphöhle darstellt, verlängert sich seitwärts hinein und giebt, wie zu vermuthen ist, für jedes Zähnchen einen hinaufsteigenden Fortsatz ab."

2. The type species, by monotypy, is *Gnathodus mosquensis.* Pander (1856, pl. 2A, fig. 10, a,b,c) figured one view each of three specimens of the species. He also illustrated a close-up drawing of the microstructure of a broken piece of a free blade that presumably also derived from *G. mosquensis.* Pander (1856: 83) stated that these specimens came from the Mountain Limestone (Bergkalk) in "Moskau, hinter der Dragomilowschen Sastawa". A holotype of the species was not designated and no lectotype has subsequently been selected. All of the types are now lost and, to our knowledge, no specialist has ever had the opportunity to study them. A thorough search for the type material in the cities where Pander lived – Leningrad, Kazan and Moscow – was undertaken by S.P. Sergeeva, W.C. Khalymbadzha, I.S. Barskov, A.S. Alekseev and N.V. Goreva, but this was unsuccessful. It is not clear to us that the material was ever deposited in a museum.

3. That Pander (1856) illustrated only one view of each of the types suggests to us that he himself had only one view of each specimen available. We think it likely that the primary types were

embedded in stone in such a way that only one view was available for study. This was common practice among conodont specialists in the last century and the beginning of the current one, as techniques for extracting conodonts intact from stone had not yet been developed. All modern specialists agree that adequate study of conodonts necessitates the viewing of all aspects of the specimen. In the case of Pander's illustrated specimens, pl.2A, figs. 10, 10a, only lateral views are shown and in the case of fig. 10b, only a lower view is available. In the genera *Streptognathodus* Stauffer & Plummer, 1932, *Idiognathodus* Gunnell, 1931, *Idiognathoides* Harris & Hollingsworth, 1933, *Neognathodus* Dunn, 1970 and *Declinognathodus* Dunn, 1966, it is imperative to study the upper surface in order to make a positive identification and to distinguish them from *Gnathodus*. Knowledge of the shape of the basal cavity (lower surface) limits identification only to the Family GNATHODIDAE and a lateral view can be easily confused with representatives of the Family POLYGNATHIDAE. Thus, the important view for unequivocal identification of *Gnathodus* was not originally illustrated by its author and may not have been available in the original type material.

4. Since Pander's (1856) original description, *Gnathodus* has always been thought to be dominantly Lower Carboniferous in age. This is probably because he stated that it came from the Mountain Limestone, a stratigraphic unit that is Lower Carboniferous in age in its type area in Great Britain. As such, forms having a large posteriorly set basal cavity and a free blade that continues as a median carina to the posterior end of the platform, have been assigned to the genus at least since the study of Roundy (*in* Roundy, Girty & Goldman, 1926). However, early Upper Carboniferous forms now assigned to *Neognathodus* Dunn, 1970, and in some cases *Idiognathoides* Harris & Hollingsworth, 1933 and *Declinognathodus* Dunn, 1966, have formerly been assigned to *Gnathodus*. No less than 1,000 references to this Lower and early Upper Carboniferous concept of the genus *Gnathodus* have been made in the literature and over 80 species have been described. Thus, even though the true identity of the type specimens of *Gnathodus* has never been known, the genus has taken on a definite meaning for a globally distributed group of conodonts in Lower and early Upper Carboniferous rocks.

5. Recently, Barskov, Alekseev & Goreva (1977) stated that the type locality is no longer extant. For unspecified reasons, they determined the original horizon from which the type material came to be the Dorogomilaer Horizon within the Dorogomilaer beds of Kasimovian age (late Upper Carboniferous). If this is correct, then the type collection is of late Upper Carboniferous age and almost

certainly not a species belonging in the traditional concept of *Gnathodus*. These authors examined old samples in the collections of the Palaeontological Institute of the Academy of Sciences of the U.S.S.R. that they stated came from the collecting locality of the type [by type, we assume they mean the type species of the genus]. But these old samples were vugular dolomites that did not yield any conodonts. Pander (1856: 33) stated that the original type material came from marls, a significantly different lithology from a vugular dolomite. Thus, the true affinities of the type species of *Gnathodus* will never be known, nor is it possible to establish a neotype from topotypic material. However, Barskov, Alekseev & Goreva (1977) concluded, on the assumption that their determination of the type horizon is correct, that *G. mosquensis* is probably a representative of one of the Upper Carboniferous genera *Streptognathodus* Stauffer & Plummer or *Idiognathodus* Gunnell. They recovered *Streptognathodus cancellosus* Gunnell, 1931, and *S. oppletus* Ellison, 1941, from beds below, above and within the Dorogomilaer Horizon. However, they stated that *Streptognathodus excelsus* Stauffer & Plummer, 1932, was not found within the Dorogomilaer Horizon, but is known from both older and younger beds. Thus, they concluded:

(a) because of the impossibility at this time to find the type material of *G. mosquensis,* the species must be treated as a *nomen dubium:*

(b) it is not yet possible to know the proper affinities of *G. mosquensis.* If in the future it becomes necessary to synonymize the genera *Idiognathodus* and *Streptognathodus,* then the name *Gnathodus* must be used in order not to create nomenclatural conflict:

(c) in the Lower Carboniferous, species traditionally assigned to *Gnathodus* should in the future be placed in the genus *Dryphenotus* Cooper, 1939, the next younger Lower Carboniferous name that had been previously treated as a junior synonym of *Gnathodus.*

6. These facts and conclusions were informally presented to the participants of the VIII International Carboniferous Congress in Moscow in 1975 by A.S. Alekseev. Later, based on this informal presentation, Kozur & Mostler (1976) and Kozur & Mock (1977) synonymized *Streptognathodus cancellosus* with *G. mosquensis* and stated that the generic name *Gnathodus* should be used only for Upper Carboniferous forms. It is, of course, impossible for the latter authors to be certain of this conclusion because the original type material is not extant and Pander's illustrations do not show the critical features necessary to support such a synonymy.

7. We agree with Barskov, Alekseev & Goreva (1977) that *Gnathodus mosquensis* should be treated as a *nomen dubium* and that the actions of Kozur & Mostler (1976) and Kozur & Mock (1977) in synonymizing *S. cancellosus* with *G. mosquensis* are unwarranted. However, we do not agree with their suggestion that the name *Gnathodus* should be used for forms previously assigned to *Streptognathodus* and/or *Idiognathodus.* The fact remains that the primary types of *Gnathodus mosquensis* are irretrievably lost. The possibility of establishing a neotype is frustrated by the fact that the affinities of the original type material, as well as the site of the original type horizon and locality, cannot be reconstructed. Therefore, we cannot accept changing the long-established concept of this important genus based on circumstantial evidence.

8. We believe that in the interest of nomenclatural stability, the name *Gnathodus* must be preserved in the sense it has always retained since Pander's (1856) original description: it is nomenclatural stability, not only in the palaeontological literature that is at stake, but also in stratigraphic literature. In the biostratigraphic zonation of the British Avonian (Lower Carboniferous) by Rhodes, Austin & Druce (1969, fig. 12) the generic name *Gnathodus* is used no less than five times in the major subdivisions. In the case of the North American Mississippian zonation by Collinson, Rexroad & Thompson (1971, table 1), the name *Gnathodus* is used eight times in the major subdivisions. These zonal names have been employed repeatedly in the literature since their original definitions. If *Gnathodus* is removed from its traditional concept, then it will also necessitate zonal name changes that are now well established in the stratigraphic literature.

9. *Gnathodus texanus* Roundy represents the next oldest named species of *Gnathodus* conforming with the long-employed concept of the genus. The type specimen of this species, which is here proposed to be designated as type species of *Gnathodus,* is a free specimen that is still available in the collections of the United States National Museum in Washington, D.C. and we recently have had the opportunity to examine it. The geographic and stratigraphic particulars of its type horizon in the Barnett Shale of central Texas are clearly stated by Roundy (*in* Roundy, Girty & Goldman, 1926: 17, Locality 2688).

10. Because the type collection is irretrievably lost; because the affinities of the original type specimen will never with certainty be established; because the original type horizon and outcrop as inferred by Barskov, Alekseev & Goreva (1977) is no longer available and because the genus *Gnathodus* has always been

employed for a group of conodonts occurring only in Lower and early Upper Carboniferous rocks, we ask the International Commission on Zoological Nomenclature:

(1) to exercise its plenary powers to set aside all designations of type species hitherto made for the nominal genus *Gnathodus* Pander, 1856, and having done so, to designate *Gnathodus texanus* Roundy, 1926, to be the type species of that genus;

(2) to place the generic name *Gnathodus* Pander, 1856 (gender: masculine), type species by designation under the plenary powers in (1) above, *Gnathodus texanus* Roundy, 1926, on the Official List of Generic Names in Zoology;

(3) to place the specific name *texanus* Roundy, 1926, as published in the binomen *Gnathodus texanus* (specific name of type species of *Gnathodus* Pander, 1856), on the Official List of Specific Names in Zoology.

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